**How do materials get in and out of cells?**

**Cell Boundaries**

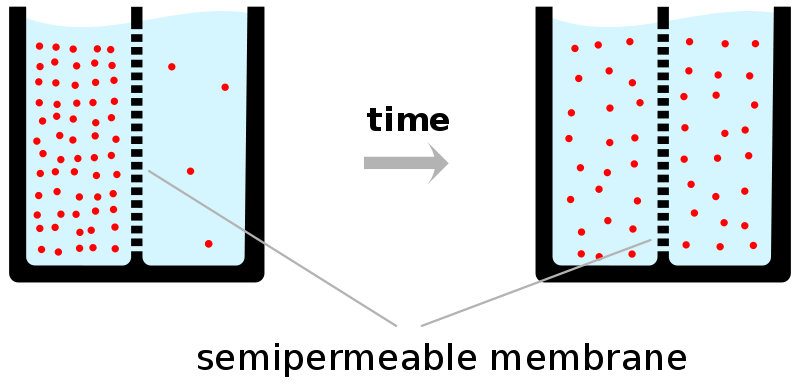
A thin, flexible barrier known as the **cell membrane** surrounds all cells. The makeup of most cell membranes is a double-layered sheet of fats with some proteins mixed in. The cell membrane controls what enters and leaves the cell, and it protects and supports the cell. One of the most important functions of the cell membrane, however, is to control the movement of dissolved molecules from the liquid on the one side of the membrane to the liquid on the other side.

Cells of plants, algae, fungi and many prokaryotes also have a strong supporting layer called a **cell wall** surrounding the cell membrane. The main job of the cell wall is to support and protect the cell.

**Movement of Materials**

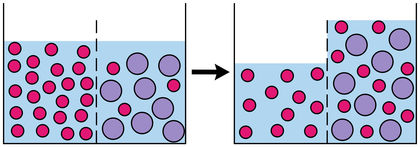
The cytoplasm of a cell is a solution of many substances in water. Particles in a solution move constantly. Particles tend to move from an area where they are more concentrated to an area where they are less concentrated. This process is called **diffusion**. Diffusion does not require energy.

Diffusion:



Water passes easily across most membranes. **Osmosis** is the diffusion of water through a selectively permeable membrane. A semi-permeable membrane is a membrane that some substance can pass through, while others cannot.

Osmosis (pink=water molecules):



Many cell membranes have protein channels that let other molecules cross the membrane. The process is called **facilitated diffusion**. It does not require the cell to use energy. The cell can also use something called **active transport,** which does require energy. Active transport occurs when cells move materials from one side of a membrane to the other side against the concentration difference.

